Plates

To illustrate a

Thesis

On the Anatomy and Physiology of the Central Nervous System

by

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PLATE I.

Fig. 1. represents the lesion in Exp. 1. made at the level of the 9th dorsal nerve roots: a. is the cicatrix formed of white fibrous tissue filling in the gap made by the knife on the right side of the cord; b. represents a slight degeneration (probably "traumatic") in the anterior and posterior median columns on the opposite side; c. is the left grey crescent, and d. the white matter.

Fig. 2. represents the lesion in Exp. 2. made at the level of the seventh dorsal nerve roots. The lettering is similar to that in fig. 1.
PLATE II.

This plate represents the degenerations following the hemisection of the left side of the cord in Exp. 3 between the third and fourth cervical nerves.

Fig. 1. is a transverse section at the second cervical nerve showing the ascending degenerations. G is the column of Goll.
D.C.T. is the direct cerebellar tract.
A.L.T. is the asc-antero-lateral tract of Gowers.
B is the posterior root zone.
C.P.T. is the crossed pyramidal tract.

Fig. 2. is a transverse section at the seventh cervical nerve showing the descending degenerations. The lettering is similar to the previous figure.
D.P.T. is the direct pyramidal tract.
PLATE III.

This plate represents the lesion made in Exp. 5, between the fourth and fifth cervical nerves. 

a. is the cicatrix on the left side, containing two islands of degenerated white matter as described in the text, b. is sclerosis in the Right Column of Goll, c. and d. are the grey and white matter of the right side in a healthy state.

In this case the relative positions of the structures have been somewhat disturbed, so that a slight contortion of the posterior horn is observed.
PLATE IV.

Scheme illustrating the paths of sensation in the spinal cord indicated by the experiments recorded in the text - (Pages 10-27).

The black lines are the sensory fibres from the lower limbs, the red from the upper limbs.

A. Decussation of some of the fibres subserving tactile sensibility.

B. Decussation of the fibres of painful sensation.

C. The decussated sensory fibres from the lower limbs.

D. Fibres subserving tactile sensibility of the upper limbs.

E. Fibres subserving painful sensibility of the upper limbs.

a. Probable decussation high up of the fibres of tactile sensibility which have not decussated lower down.
Transverse section of the spinal cord of a monkey in the lower cervical region showing degenerations descending from a hemisection in the upper cervical region on the left side.

- Direct cerebellar tract
- Crossed pyramidal tract
- Direct pyramidal tract

The shaded portions of the skeleton represent the degenerated areas in the photo-micro.
Plate VI

Monkey; lumbar region; Wagens-Pal; photomicro.

Transverse section of the spinal cord of a monkey, in the lumbar region, showing degenerations descending from a hemisection on the left side.

The shaded portions of the skeleton represent the degenerated areas in the photo-micro.
Transverse Section of the human spinal cord in the dorsal region showing degenerations descending from a transverse lesion of the spinal cord.

The crossed pyramidal tract.

Descending "comma" tract of the posterior column.

The shaded portions of the skeleton represent the unstained or degenerated parts of the photomicrograph.
Transverse Section of the spinal cord of a Monkey in the upper conical region showing degenerations ascending from a hemisection of the left side of the seventh dorsal nerve roots.

- Jell's column
- Direct cerebellar tract
- Outlying portion of broad pyramidal tract
- Antero-lateral tract

The shaded parts of the skeleton represent the unstained (degenerated) parts of the photomicrograph.
Section of the cord at the level of the second cervical nerve, showing degeneration ascending from a hemisection of the same side between the third and fourth cervical nerves.

It is to be observed that zollingerianum is of much greater extent at this level after a hemisection between the third and fourth cervical nerves, than at the same level after a hemisection in the mid-dorsal region.

[Text: pp 43, 44; cp. Plate VIII.]
A transverse section of the spinal cord immediately above a hemisection of the left side in the mid-dorsal region. Goll's column, the direct cerebellar antero-lateral ascending tract are deeply seamed, while the posterior root zone on the same side is partly degenerated, probably with interference with the continuity of the posterior nerve roots at the seat of the lesion.
Section of the medulla oblongata of a monkey at the level of the pyramidal decussation showing the tracts ascending from a hemisection of the spinal cord.

- Frenu. curvatus
- Sulcus Rolandi
- Pyramidal decussation
- Anter. cornu
- Jol's column
- Direct cerebello-antero-lateral tracts
Section of the medulla oblongata of a monkey at the level of the mid-brain showing the tracts ascending from a hemisection of the spinal cord.

IVth-Vth

Ass. root, glossopharyngeal nerve
Corpus restiforme

Direct cochlear tract

Nerve. Vagus

Vth cran. root

Vert.: aortic, medial tegm.

Int.: olivary, tegm. medii

Median tract

Olive

Auto. lateral tract
PLATE XIII.

This plate is a semidiagramatic representation of the origin, course and termination of the antero-lateral ascending and direct cerebellar tracts; the former is coloured red, the latter black.

The Direct Cerebellar tract (D.C.T.) is traced from the lower dorsal region to the restiform body (Inferior cerebellar peduncle) of the same side.

The antero-lateral tract (asc.a-l,t) is traced from the lumbar enlargement, through the spinal cord and medulla oblongata to the superior cerebellar peduncle of the same side.

The lettering below the individual figures represents the level at which the corresponding section has been taken; e.g. C₂ is a section at the level of the second cervical nerve roots.
This plate shows the direct cerebellar tract as a linear degeneration passing into the restiform body on the right hand side of the picture (X).

The antero-lateral tract remains just dorsal to the olive (x').
PLATE XV.

This plate illustrates schematically the effects of hemisection of the spinal cord upon the motor functions and their mode of restoration - The redlines are the motor fibres which come from the left side of the brain, the black from the right side - The fibres which cross from the right to the left side of the cord only are represented.-

A. The left crossed pyramidal tract.
B. The left direct pyramidal tract.
C. Fibres from the right direct pyramidal tract to the left anterior horns.
D. The right crossed pyramidal tract.
E. The right direct pyramidal tract.
F. Hypothetical fibres passing from the right to the left side of the cord.-
G. The so-called "recrossed fibres."
+ The lesion of the left side of the cord.
PLATE XVI.

Scheme illustrative of the effects of hemisection of the spinal cord on sensation and the manner in which it is restored.

The black lines represent sensory fibres passing to the left side of the brain; the red the sensory fibres to the right side of the brain.

+ The lesion.

A. The sensory path on the left side of the spinal cord.
B. The sensory path on the right side.
C. Fibres decussating from right to left.
D. Fibres decussating from left to right.

a.b.c. Non-decussating commissural fibres between segments of the cord at different levels, which probably bring about the restoration of the sensory functions.
PLATE XVII.

This plate is a scheme illustrating the effects of a second hemisection of the spinal cord after recovery from a previous section of the opposite side.-(Exp.I.p.63.)

+ The first hemisection.
+' The second hemisection.
A. Fibres from the direct pyramidal tract of one side to the anterior horn of the opposite side.
B. Hypothetical fibres from one side to the opposite side.
C. "Recrossed fibres."

a.b. Non-decussating commissural fibres between segments of the cord at different levels.

The black lines represent motor fibres, the red sensory fibres.

This is a combination of those on plates XV and XVI to which scheme reference is to be made for the tracts not specially lettered.
Fig. I represents a section drawn from nature transversely through the nucleus of the third cranial nerve. The right side represents in outline the structures depicted on the left side of the figure:—Nos. 1, 2 and 3 represent the median, dorso-lateral, and ventro-lateral cell groups of the nucleus—(Page 75 of the text).

Fig. II. is a horizontal longitudinal section of the medulla oblongata of a monkey showing the probable connection between the hypoglossus nucleus and the issuing root of the portio dura, by way of the fibres of the posterior longitudinal fasciculus. The left side of the figure represents in outline the structures depicted on the right side.—(Page 82 of the text).
PLATE XIX.

Fig. I represents a section of the region of the hypoglossal and vago-accessory nuclei from the human subject. The atrophied state of the hypoglossal nucleus is depicted; while the vago-accessory nucleus presents a healthy appearance. Figs. 2 and 3 represent the condition of the cells of the hypoglossal nucleus under a high power from the normal and atrophied nucleus respectively. (Page 76 of the text).

Fig. 4. is a transverse section through the medulla oblongata of a monkey showing the relation of the issuing roots of the vago-accessory nerve to the hypoglossus nucleus of the same side and the posterior longitudinal fasciculus of the same and of the opposite sides. The right side of the figure gives in outline the structures delineated on the left side. (Page 86 of the text).
PLATE XX.

This plate is a schematic representation of the origin of some of the fibres contained in certain of the cranial nerves (Chap. III.)

A. Nucleus of the third nerve (oculo-motor nucleus)
   a a' fibres for the orbicularis palpebrarum and frontalis muscles.
   b b' fibres for the facial muscles proper.
   c c' fibres for the orbicularis oris.

B. The nucleus of the portio dura (seventh nucleus)

C. Hypoglossal Nucleus.

D. Vago-accessory nucleus.
   d d' Fibres for the palatal muscles.
   e e' Fibres for the muscles which move the vocal cords.
   f f' The hypoglossal nerve.

The red lines indicate the fibres in a nerve which arise from nuclei other than the majority of the fibres of that nerve.